

**WHAT IS CLAIMED IS:**

1. A distributed call progress tone detection system  
couplable to a packet network, comprising:

a switching partition couplable to said packet network and  
including:

line interface modules configured to provide an interface  
to corresponding access nodes,

a call progress tone detector configured to perform call  
progress tone detection analysis and generate an indication  
thereof, and

an input-output distributor configured to employ a  
circuit to interconnect said call progress tone detector and  
a first of said line interface modules to allow said call  
progress tone detector to perform said call progress tone  
detection analysis with respect to said first of said line  
interface modules; and

a main control unit configured to receive requests from an  
application over said packet network, transmit call and control  
processing commands to said switching partition, create an  
interconnection between said first of said line interface modules  
and a second of said line interface modules based on said  
indication and notify said application of said interconnection.

2. The distributed call progress tone detection system as  
recited in Claim 1 wherein said call progress tone detector  
includes energy detection.

3. The distributed call progress tone detection system as  
recited in Claim 1 wherein said call progress tone detector  
includes energy detection with guard band elimination.

4. The distributed call progress tone detection system as  
recited in Claim 1 wherein said call progress tone detector is  
further configured to receive at least one tunable parameter and  
adjust said call progress tone detection analysis on a call-by-call  
basis thereof.

5. The distributed call progress tone detection system as  
recited in Claim 4 wherein said at least one tunable parameter is  
selected from the group consisting of:

- a software answer detect time,
- a hardware answer detect time,
- a ring no answer time,
- a minimum call answer time,
- a recorded human speech detect time,
- a maximum resource wait time, and
- a pause wait time after speech detected.

6. The distributed call progress tone detection system as  
recited in Claim 1 wherein said indication is selected from the  
group consisting of:

- a busy tone,
- a reorder tone,
- a ring back tone with no answer,
- a human speech with answer quickly,
- a human speech with pause detected after speech,
- a recorded human speech,
- a facsimile/modem,
- a Telco Intercept, and
- a no energy detected before answer detect time expired.

7. The distributed call progress tone detection system as  
recited in Claim 1 wherein said line interface modules are  
dynamically configurable via program downloads.

8. The distributed call progress tone detection system as  
recited in Claim 1 wherein said call progress tone detector may be  
embodied within at least one of said line interface modules.

9. The distributed call progress tone detection system as  
recited in Claim 1 wherein said call progress tone detector may be  
embodied within software downloaded to at least one of said line  
interface modules.

10. The distributed call progress tone detection system as  
recited in Claim 1 wherein said main control unit further notifies  
said application of said indication.

11. The distributed call progress tone detection system as  
recited in Claim 1 wherein said call and control processing  
commands are selected from the group consisting of:

- a no answer supervision command,
- a use network answer supervision command,
- a best try full analysis command, and
- a full call progress analysis command.

12. The distributed call progress tone detection system as  
recited in Claim 1 wherein said main control unit is further  
configured to auto-terminate a call on said first of said line  
interface modules if an access node coupled to said second of said  
line interface modules is unavailable.

13. The distributed call progress tone detection system as  
recited in Claim 12 wherein a timeout period, associated with an  
availability of said access node, elapses before said main control  
unit auto-terminates said call.

14. The distributed call progress tone detection system as  
recited in Claim 1 further comprising said application and wherein  
said application is selected from the group consisting of:

a non-predictive dialer,  
a predictive dialer,  
an answering machine dialer, and  
a call center.

15. The distributed call progress tone detection system as  
recited in Claim 14 wherein, upon receiving said notification from  
said main control unit, said application is configured to transmit  
information associated with said request to a terminal coupled to  
a third of said line interface modules that is associated with said  
second of said line interface modules.

16. The distributed call progress tone detection system as  
recited in Claim 1 wherein said circuit is a circuit-switched  
matrix configured to control and selectively interconnect said line  
interface modules and said call progress tone detector.

17. A method of operating a distributed call progress tone  
2 detection system couplable to a packet network, comprising:

3 receiving requests from an application over said packet  
4 network and transmitting transmit call and control processing  
5 commands to a switching partition via a main control unit;

6 providing an interface to corresponding access nodes via line  
7 interface modules;

8 generating a call on a first of said line interface modules;

9 employing an input-output distributor to interconnect a call  
10 progress tone detector and said first of said line interface  
11 modules to allow said call progress tone detector to perform a call  
12 progress tone detection analysis and generate an indication thereof  
13 with respect to said first of said line interface modules; and

14 creating an interconnection between said first of said line  
15 interface modules and a second of said line interface modules based  
16 on said indication via said input-output distributor and notifying  
17 said application of said interconnection.

18. The method as recited in Claim 17 wherein said call  
2 progress tone detection analysis further includes performing energy  
3 detection.

19. The method as recited in Claim 17 wherein said call  
progress tone detection analysis further includes performing energy  
detection with guard band elimination.

20. The method as recited in Claim 17 wherein said call  
progress tone detection analysis further includes receiving at  
least one tunable parameter and adjusting said call progress tone  
detection analysis on a call-by-call basis thereof.

21. The method as recited in Claim 20 wherein said at least  
one tunable parameter is selected from the group consisting of:

- a software answer detect time,
- a hardware answer detect time,
- a ring no answer time,
- a minimum call answer time,
- a recorded human speech detect time,
- a maximum resource wait time, and
- a pause wait time after speech detected.

22. The method as recited in Claim 17 wherein said indication  
is selected from the group consisting of:

- a busy tone,
- a reorder tone,
- a ring back tone with no answer,

6 a human speech with answer quickly,  
7 a human speech with pause detected after speech,  
8 a recorded human speech,  
9 a facsimile/modem,  
10 a Telco Intercept, and  
11 a no energy detected before answer detect time expired.

23. The method as recited in Claim 17 wherein said line  
2 interface modules are dynamically configurable via program  
3 downloads.

24. The method as recited in Claim 17 wherein said call  
2 progress tone detector may be embodied within at least one of said  
3 line interface modules.

25. The method as recited in Claim 17 wherein said call  
2 progress tone detector may be embodied within software downloaded  
3 to at least one of said line interface modules.

26. The method as recited in Claim 17 further comprising  
2 notifying said application of said indication.



27. The method as recited in Claim 17 wherein said call and  
control processing commands are selected from the group consisting  
of:

- a no answer supervision command,
- a use network answer supervision command,
- a best try full analysis command, and
- a full call progress analysis command.

28. The method as recited in Claim 17 further comprising  
auto-terminating a call on said first of said line interface  
modules if an access node coupled to said second of said line  
interface modules is unavailable.

29. The method as recited in Claim 28 wherein said auto-  
terminating further includes elapsing a timeout period, associated  
with an availability of said access node, before said auto-  
terminating said call.

30. The method as recited in Claim 17 further comprising said  
application and wherein said application is selected from the group  
consisting of:

- a non-predictive dialer,
- a predictive dialer,
- an answering machine dialer, and

7 a call center.

31. The method as recited in Claim 17 further comprising,  
2 upon receiving said notification, transmitting information  
3 associated with said request to a terminal coupled to a third of  
4 said line interface modules that is associated with said second of  
5 said line interface modules via said application.

32. The method as recited in Claim 17 wherein said  
2 input-output distributor employs a circuit-switched matrix to  
control and selectively interconnect said line interface modules  
and said call progress tone detector.

33. A distributed call progress tone detection system  
couplable to a packet network, comprising:  
a switching partition means couplable to said packet network  
and including:  
line interface means that provides an interface to  
corresponding access nodes,  
a call progress tone detection means that performs call  
progress tone detection analysis and generates an indication  
thereof, and  
an input-output distributor means that employs a circuit  
means to interconnect said call progress tone detection means  
and a first of said line interface means to allow said call  
progress tone detection means to perform said call progress  
tone detection analysis with respect to said first of said  
line interface means; and  
a main control unit means that receives requests from an  
application means over said packet network, transmits call and  
control processing commands to said switching partition means,  
creates an interconnection between said first of said line  
interface means and a second of said line interface means based on  
said indication and notify said application means of said  
interconnection.

34. The distributed call progress tone detection system as  
recited in Claim 33 wherein said call progress tone detection means  
includes energy detection.

35. The distributed call progress tone detection system as  
recited in Claim 33 wherein said call progress tone detection means  
includes energy detection with guard band elimination.

36. The distributed call progress tone detection system as  
recited in Claim 33 wherein said call progress tone detection means  
further receives at least one tunable parameter and adjusts said  
call progress tone detection analysis on a call-by-call basis  
thereof.

37. The distributed call progress tone detection system as  
recited in Claim 36 wherein said at least one tunable parameter is  
selected from the group consisting of:

- a software answer detect time,
- a hardware answer detect time,
- a ring no answer time,
- a minimum call answer time,
- a recorded human speech detect time,
- a maximum resource wait time, and
- a pause wait time after speech detected.

38. The distributed call progress tone detection system as  
recited in Claim 33 wherein said indication is selected from the  
group consisting of:

- a busy tone,
- a reorder tone,
- a ring back tone with no answer,
- a human speech with answer quickly,
- a human speech with pause detected after speech,
- a recorded human speech,
- a facsimile/modem,
- a Telco Intercept, and
- a no energy detected before answer detect time expired.

39. The distributed call progress tone detection system as  
recited in Claim 33 wherein said line interface means are  
dynamically configurable via program downloads.

40. The distributed call progress tone detection system as  
recited in Claim 33 wherein said call progress tone detection means  
is embodied within at least one of said line interface means.

41. The distributed call progress tone detection system as  
2 recited in Claim 33 wherein said call progress tone detection means  
3 is embodied within software downloaded to at least one of said line  
4 interface means.

42. The distributed call progress tone detection system as  
2 recited in Claim 33 wherein said main control unit means further  
3 notifies said application means of said indication.

43. The distributed call progress tone detection system as  
recited in Claim 33 wherein said call and control processing  
commands are selected from the group consisting of:

- a no answer supervision command,
- a use network answer supervision command,
- a best try full analysis command, and
- a full call progress analysis command.

44. The distributed call progress tone detection system as  
2 recited in Claim 33 wherein said main control unit means also auto-  
3 terminates a call on said first of said line interface means if an  
4 access node coupled to said second of said line interface means is  
5 unavailable.

45. The distributed call progress tone detection system as  
recited in Claim 44 wherein a timeout period, associated with an  
availability of said access node, elapses before said main control  
unit means auto-terminates said call.

46. The distributed call progress tone detection system as  
recited in Claim 33 further comprising said application means and  
wherein said application means is selected from the group  
consisting of:

- a non-predictive dialer,
- a predictive dialer,
- an answering machine dialer, and
- a call center.

47. The distributed call progress tone detection system as  
recited in Claim 46 wherein, upon receiving said notification from  
said main control unit means, said application means transmits  
information associated with said request to a terminal coupled to  
a third of said line interface means that is associated with said  
second of said line interface means.

48. The distributed call progress tone detection system as  
2 recited in Claim 33 wherein said circuit means is a  
3 circuit-switched matrix means that controls and selectively  
4 interconnects said line interface means and said call progress tone  
5 detection means.



49. An enterprise call center with call progress tone  
2 detection coupled to a packet network, comprising:

3 switching partitions coupled to said packet network and  
4 including:

5 line interface modules that provide an interface to  
6 corresponding access nodes,

7 a call progress tone detector that performs call progress  
8 tone detection analysis and generates an indication thereof,  
9 and

10 an input-output distributor that employs a circuit to  
11 interconnect said call progress tone detector and a first of  
12 said line interface modules to allow said call progress tone  
13 detector to perform said call progress tone detection analysis  
14 with respect to said first of said line interface modules;

15 a primary main control unit associated with a first location  
16 and coupled to said packet network; and

17 a secondary main control unit associated with a second  
18 location and coupled to said packet network, at least one of said  
19 primary and secondary main control units receiving requests from an  
20 application over said packet network, transmitting call and control  
21 processing commands to at least one of said switching partitions,  
22 creating an interconnection between said first of said line  
23 interface modules and an agent coupled to one of said line  
24 interface modules in one of said switching partitions based on said

25 indication and notifying said application of said interconnection.

50. The enterprise call center as recited in Claim 49 wherein  
2 said call progress tone detector includes energy detection.

51. The enterprise call center as recited in Claim 49 wherein  
2 said call progress tone detector includes energy detection with  
3 guard band elimination.

52. The enterprise call center as recited in Claim 49 wherein  
said call progress tone detector further receives at least one  
tunable parameter and adjusts said call progress tone detection  
analysis on a call-by-call basis thereof.

53. The enterprise call center as recited in Claim 52 wherein  
said at least one tunable parameter is selected from the group  
consisting of:

- 4 a software answer detect time,
- 5 a hardware answer detect time,
- 6 a ring no answer time,
- 7 a minimum call answer time,
- 8 a recorded human speech detect time,
- 9 a maximum resource wait time, and
- 10 a pause wait time after speech detected.

54. The enterprise call center as recited in Claim 49 wherein  
2 said indication is selected from the group consisting of:  
3 a busy tone,  
4 a reorder tone,  
5 a ring back tone with no answer,  
6 a human speech with answer quickly,  
7 a human speech with pause detected after speech,  
8 a recorded human speech,  
9 a facsimile/modem,  
10 a Telco Intercept, and  
11 a no energy detected before answer detect time expired.

55. The enterprise call center as recited in Claim 49 wherein  
2 said line interface modules are dynamically configurable via  
3 program downloads.

56. The enterprise call center as recited in Claim 49 wherein  
2 said call progress tone detector may be embodied within at least  
3 one of said line interface modules.

57. The enterprise call center as recited in Claim 49 wherein  
2 said call progress tone detector may be embodied within software  
3 downloaded to at least one of said line interface modules.

58. The enterprise call center as recited in Claim 49 wherein  
said at least one of said primary and secondary main control units  
further notifies said application of said indication.

59. The enterprise call center as recited in Claim 49 wherein  
said call and control processing commands are selected from the  
group consisting of:

- a no answer supervision command,
- a use network answer supervision command,
- a best try full analysis command, and
- a full call progress analysis command.

60. The enterprise call center as recited in Claim 49 wherein  
said at least one of said primary and secondary main control units  
further auto-terminates a call on said first of said line interface  
modules if all of said line interface modules, in each of said  
switching partitions, associated with agents are unavailable.

61. The enterprise call center as recited in Claim 60 wherein  
a timeout period, associated with an availability of said agents,  
elapses before said at least one of said primary and secondary main  
control units auto-terminates said call.

62. The enterprise call center as recited in Claim 49 further  
comprising said application and wherein said application is  
selected from the group consisting of:

- a non-predictive dialer,
- a predictive dialer,
- an answering machine dialer, and
- a call center.

63. The enterprise call center as recited in Claim 62  
wherein, upon receiving said notification from said main control  
unit, said application transmits information associated with said  
request to a terminal coupled to another of said line interface  
modules in said one of said switching partitions that is associated  
with said agent coupled to said one of said line interface modules  
in said one of said switching partitions.

64. The enterprise call center as recited in Claim 49 wherein  
said circuit is a circuit-switched matrix that controls and  
selectively interconnects said line interface modules and said call  
progress tone detector.